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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/049,270	06/27/2002	Hui Zhong	Q68281	9445

23373 7590 10/06/2004  
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WASHINGTON, DC 20037

EXAMINER
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DINH, TUAN T

ART UNIT	PAPER NUMBER
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2841

DATE MAILED: 10/06/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/049,270

**Applicant(s)**

ZHONG ET AL.

**Examiner**

Tuan T Dinh

**Art Unit**

2841

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-35 is/are pending in the application.
- 4a) Of the above claim(s) 22 and 29 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 10, 11, 14-21, 23-28 and 30 is/are rejected.
- 7) ☒ Claim(s) 9 and 31-35 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>02/11/02</u> . | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Applicant's election of Specie I (figures 1-5, claims 1-11, 14-21, 23-28, and 30-35) in the reply filed on June 21, 2004 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

#### ***Claim Objections***

2. Claim 5 is objected to because of the following informalities:

Claim 5, line 3, "an inorganic filler" should be —the inorganic filler—for proper antecedence basis.

Appropriate correction is required.

#### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2, 4-8, 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reed (U.S. Patent 4,211,603) in view of Miyamura et al. (U.S. Patent 5,055,378).

As to claims 1, 4, Reed discloses a multilayered printed circuit board as shown in figures 1-4 comprising:

a conductor circuit (12) and a resin insulating layer (22) serially formed on a substrate (16) in alternate fashion and in repetition; and

a solder resist layer (46) formed as an outermost layer, see figure 4.

Reed does not disclose said solder resist layer (46) containing an inorganic filler and elastomer.

Miyamura et al. teaches a solder resist composition used for a PCB, see column 1, lines 6-7, and the composition contain an inorganic filler and elastomer, see column 2, lines 22-33.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a solder resist composition containing an inorganic filler and elastomer as taught by Miyamura et al. to modify the solder resist of Reed for the purpose of providing a solder heat resistance, adhesivity, and surface hardness.

Regarding claims 5-6, Miyamura et al. shows the solder resist composition to be used in manufacturing the PCB, and the inorganic filler being mixed with a paste containing a resin for a solder resist layer, column 7, lines 47-65.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a solder resist composition containing an inorganic filler being mixed with a paste containing a resin as taught by Miyamura et al. to modify the solder resist of Reed for the purpose of providing a strong bonding on the surface of the PCB.

Regarding claims 7-8, 10, Reed disclose the claimed invention, except for said solder resist layer contains an inorganic filler, and an elastomer component in a composition comprising a resin for said solder resist layer, said elastomer component is at least one member selected from a thermosetting resin.

Miyamura shows a solder resist composition contains an inorganic filler, and an elastomer having a resin, and the elastomer is a thermosetting resin, see column 2, lines 22-33, column 4, lines 48-68.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to employ a solder resist composition containing an inorganic filler and a thermosetting resin as taught by Miyamura et al. to modify the solder resist of Reed for the purpose of providing a solder heat resistance, and an excellent latent curing properties under high temperature on the surface of the PCB.

As to claims 2, 11, Miyamura et al. shows said inorganic filler is at least one member selected from the group consisting of an aluminum compound, see column 5, line 44.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have the inorganic filler is at least one member selected from aluminum or silicon compound as taught by Miyamura et al. to modify the solder resist of Reed for the purpose of providing a heat resistance suitable on the surface of the PCB.

5. Claims 14-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reed ('603) in view of Kataoka et al. (U.S. Patent 6,011,488).

Regarding claims 14-28, Reed discloses the claimed invention, except for the solder resist having a dielectric constant at 1GHz, a dielectric loss tangent of 0.01, the solder resist contains a polyolefin or cyclolefin type resin (thermosetting type resin).

Kataoka shows a solder resist having a dielectric constant at 1GHz, a dielectric loss tangent of 0.01, the solder resist contains a polyolefin or cyclolefin type resin (thermosetting type resin).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching's Kataoka et al. to modify the solder resist of Reed for the purpose of providing a heat resistance suitable on the surface of the PCB.

6. Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reed ('603) in view of Kotzsch et al. (U.S. Patent 3,869,340).

Regarding claim 30, Reed discloses the claimed invention except for said solder resist layer contains a P-atom containing epoxy resin.

Kotzsch et al. teach a solder resist contains a P-atom containing epoxy resin, column 1, lines 43-68.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching's Kotzsch et al. to modify the solder resist of Reed for the purpose of providing a heat resistance suitable on the surface of the PCB.

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7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reed ('603) in view of Miyamura et al. ('378), and further in view of Nakamura et al. (U.S. Patent 5,990,190).

Reed and Miyamura do not disclose said inorganic filler has a particle diameter within range from 0.1 to 5.0um.

Nakamura et al. teaches a particle diameter of an inorganic filler within a range from 0.1-5.0um.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have a teaching's Nakamura et al. to modify the solder resist of Reed and Miyamura for the purpose of providing a low molten viscosity.

#### ***Allowable Subject Matter***

8. Claims 9, and 31-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.


#### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan T Dinh whose telephone number is 571-272-1929. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kammie Cuneo can be reached on 571-272-1957. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Tuan Dinh  
September 29, 2004.



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